

# TEACHING READING WITH AUTHENTIC TEXTS ABOUT COMPUTERS USING THE BOTTOM UP STRATEGY

By  
Mauloeddin Afna

*Syiah Kuala University, Banda Aceh*

## ABSTRACT

This experimental research was aimed at finding out whether there was a significant difference in the achievements of students who were taught through the Bottom Up Strategy (BUS) for teaching reading comprehension using authentic texts about computers and those who were taught through the conventional way (i.e. teacher-centered). The reading comprehension was built up from three inputs: comprehension, meaning construction, and understanding of technical terms. The study relied on a decoding process of outlining the paragraph into a line of idea organization. The decoding process is easily applicable because authentic texts about computer features and computer applications were used in the teaching process. The Department of Information Technology of the Aceh Polytechnic, Banda Aceh, a vocational training institute with majors in computer information systems, was selected as the research location for this study. After 10 meetings or treatments, the t-score of the experimental class (EC) was 13.76 while the t-score of the control class (CC) was 12.48. The value of t-table at a level of significance ( $\alpha$  0.05 was 1.70 ( $t(0.95)(30) = 1.70$ ), Thus there was a significant difference between EC and CC in their reading comprehension achievements. By comparison of scores via  $13.76 > 12.48$ , it is concluded that there was a significant difference in the achievements between the two classes, thus,  $H_a$  is proved to be accepted for this study, that is using BUS for teaching reading comprehension using authentic texts about computers is more effective.

Key Words: *Bottom Up Strategy, Decoding, Authentic Texts, Computers.*

## **INTRODUCTION**

The Department of Information Technology (IT) of the Aceh Polytechnic, Banda Aceh, was established to answer the future needs for professional technicians in the computer industry, in particular to prepare students to face the challenges of the future. So, the development of curriculum was constructed based on the prospects of the computer industry. To support the objectives of the department, the students are taught skills in English especially since English is the international language most used in the interface with computers.

In the polytechnic, a clear gap was found in the teaching and learning English between students majoring in IT than those who are not in. For instance, in the IT classroom, they learned English the same general way as other students who learn English, not in a specific purpose way. Then, for other subjects that required computer applications, they used computers without realising that the computer is an electronic device that has been programmed in English. This study intends to build a bridge to connect between teaching English and the use of computers. This study used authentic texts about computers as teaching materials, considering the fact that computers are programmed devices, using English as the interface language with user-friendly features, which can assist students to learn the language. Basically, the texts are written in English, with English vocabulary such as technical terms that are commonly found in the features and applications of computers. The students are made to recognize that the language they are learning contain words that they deal with every day in the computers or other digital devices. These authentic texts are hoped to assist them in understanding English better through daily usage, and to improve the connections between learning English and learning IT.

In this study, the researcher used the Bottom Up Strategy (BUS) to find out if it could help the teachers and the students in teaching and learning English. Welbourn (1993:20) defines “bottom up strategy as a process to observe how ideas are constructed that are linked in various ways, such as form, function, and location.” The process indicates that a link is provided in order to follow how that leads to outline a paragraph. Moreover, Lieungnapar and Todd (2011:4) pointed out that the “bottom up strategy is an approach to view text genre as content and function”. Thus, the identification of BUS looked at the category of text contents for its structure. Meaning was then constructed by combining units.

### **Research Question**

This study posed one research question: “Is there a significant difference in improvement in the performance of students taught reading comprehension through the Bottom Up Strategy (BUS) using authentic texts about computers than those who are taught conventionally (i.e. teacher-centered)?”

Consequently, the following hypotheses are formulated:

H<sub>0</sub>: There is no significant different in improvement in the performance of students taught reading comprehension through Bottom Up Strategy using authentic texts about computers.

H<sub>a</sub>: There is a significant different in improvement in the performance of students taught reading comprehension through Bottom Up Strategy using authentic texts about computers.

### **Objective of Study**

Accordingly, this study was to investigate whether there is any significant difference in improvement in performance, specifically, in comprehending and constructing meanings and mastering technical terms from authentic texts about computers, between students who are taught reading comprehension through BUS using authentic texts about computers and those who are taught conventionally.

## **LITERATURE REVIEW**

### **The Bottom Up Concept**

Lee (2009) explains that the bottom-up concept focuses on the text as a convergence of encoded messages to be deciphered. It is further explained that the teacher who uses the bottom-up concept focusses on how the students extract information from the printed page, and on whether and how learners deal with words and phrases in a systematic fashion. Therefore, the goals of Bottom-Up Strategy (BUS) are automatic word recognition and a rapid reading rate. In addition, Grabe (1991) points out that to reach these aims, explicit instruction in phonics and spellings are crucial, students should not be “word-bound” when using BUS.

The effectiveness of BUS has been proved through eye-movement experiments in which native speakers were asked to read the target language to make sense of the whole verbal construction. From the bottom-up viewpoint, therefore, reading is a process of decoding written symbols into their aural equivalents. It is a text-centered move

in which texts are the containers of rules and codes to be deciphered. Specifically, in this lower-level reading process, as Grabe (1991) has pointed out, readers are passive recipients of textual information. During the decoding process, understanding the hierarchal, linguistic structures of the language ensures reading comprehension. The focus is never the meaning of the whole text, but the detailed construction of the paragraph, which is actually the writing product and consists of linguistic forms, i.e. phonemes at lexical, syntactic levels.

### **The Paragraph Decoding Process**

The decoding process is a process of word identification. Meyer (2010) says that the ability to decode refers to the process of translating printed words into sounds. It is making sounds from the written text. In decoding reading, Meyer (2010) continues that students make sounds from written words by pronouncing their parts and then joining those parts to form words. In order to read with sufficient fluency to comprehend what is being read, readers must be able to decode words and join the parts quickly and accurately to get word context. Understanding phrases starts from Phonics > Pronunciation > Spelling > Grammar > Vocabulary > Fluency > and finally to Comprehension.



**Figure 1.** Diagram of Decoding Process in Reading Comprehension.

BUS is a decoding process used with texts. It is about how to decode information that is stored in the text itself which is also called text mining. Thus, the teacher introduces the steps that lead to decoding the texts. Furthermore, Djouadi and Souam (2007) states that “most of the existing text mining approaches are proposed, keeping in mind, transaction databases model”. Thus, the mined dataset is structured using just one concept the “transaction,” whereas the whole dataset is modeled using the abstract type “set”. In such cases, the structure of the whole dataset and the relationships among the transactions themselves

are not modeled and consequently not considered in the mining process.

The teacher has to construct a lesson plan for teaching reading that accommodates text mining. As mentioned by Grabe and Stoller (2004), Bernhardt (1991) and Block (1992), text mining is classified into five phases:

1. Rooting – to find the link for text comprehension through the topic sentence, controlling idea, and title,
2. Cropping – to circle the technical terms within the texts,
3. Decoding – to identify words in the texts,
4. Organizing – to classify the word terms and meanings from the context, and
5. Projecting – to relate the comprehension of the text into the purpose for the readers.



**Figure 2.** The Five Phases in the Teaching Application.

Thus, these five phases are practiced to improve the performance of the students in reading comprehension, specifically, in comprehending the meaning of texts, constructing meaning from their context, and mastering technical terms from authentic texts concerning computers.

### **Authentic Texts Concerning Computers**

Pearsall (1998:113) defines the meaning of authentic as genuine, i.e. of undisputed origin. Taken within the pedagogical sphere, an authentic text can be seen as a text written solely for the use of the target language speakers, for pleasure or information, and of such a nature that it reflects the language and cultural experience of the target speakers within their geographical and linguistic boundaries. Generally, an authentic text is a text originally created to fulfill a social purpose in the language community for which it was intended (e.g., Grellet, 1981; Lee, 1995; Little, Devitt, & Singleton, 1989). Authentic texts are therefore unabridged examples of the target language. These texts are provided as seen, and are likely to include genuine examples of slang and other cultural references. For the first or second language teacher fictional literature is perhaps the most obvious entry point when introducing authentic texts into the classroom, but it goes without saying that all native language texts are authentic.

## **RESEARCH METHOD**

This research used several experimental treatments in the class. The treatments used a static group design for comparison of results between students who were taught reading comprehension using authentic texts about computers through BUS with students who were taught conventionally.

### **The Static Group Comparison Design**

The static group comparison design allocated the students in term of conditions. The conditions design involved two groups. The first group was the students who were taught reading comprehension using authentic texts about computers through BUS as the experimental group. Then, the second group was the students who were taught conventionally, that is teacher-centered. Both groups were pre-tested and post-tested during the study. With a static group comparison study, although, the terms experimental and control group are commonly using to describe such groups, it was simply more appropriate to call these groups comparison groups, because one served as the comparison for the other. So, BUS was a set of classroom practices, the experimental group (x1) received the treatments, and the control group (x2) did not receive the treatments.

### **The Research Variables**

The experimental research objective was constructed to find out if there was any significant difference in the reading ability of the students as a result of the experimental treatment used in this research. Whether BUS (the independent variable) would affect the reading comprehension ability of the students (the dependent variable). This research was suitable to be applied at a vocational institution that uses text materials and textbooks in English. Therefore, in the design the experimental group/class was (x1) and the control group/class was (x2) to prove the hypothesis of the study.

### **The Research Setting**

This experimental study was done at the Department of Information Technology (DIT) of the Aceh Polytechnic, in Banda Aceh, which is classified as a vocational college institution.

### **Population and Sample**

The samples were selected through a stratified sampling technique. Sugiono (2013) states that stratified sampling is the process of grouping members of a relatively homogeneous population into samples representative of the whole population. The whole 620 students in the DIT was taken as the population. The samples were homogenous, because they were all students in the DIT. Then, the population was divided according to semesters, from the first to the sixth, and this study selected the fifth semester because this semester had the most appropriate size as compared with the other semesters. Then, from the 145 active students in the fifth semester of the DIT, the study took 60 students, or 40 % by random selection to be the sample for this study. These were then randomly grouped into two classes: 30 students for the experimental class (EC) and 30 for the control class (CC) to study the improvement of students' reading comprehension ability by teaching using BUS and conventional way.

### **The Data Collection Procedure**

To collect the data, the writer conducted 10 sessions of teaching reading using BUS. The teaching process was developed from the lesson plan of teaching reading that accommodated the text mining decoding processes. As stated earlier in the previous sections, the lesson plan was divided into five phases (rooting, cropping, decoding, organizing, and projecting). These steps would not be strong enough if the students did not understand that the concept of bottom-up study actually comes from the way of learning reading by giving attention firstly to the key words, especially those for technical terms, then constructing the meaning of these words and finally gaining comprehension.

### **The Procedure of Data Analysis**

To describe the data for each of the research questions, descriptive statistics were used to find the mean, standard deviation, and  $t_{test}$ .

The criteria for examining the hypothesis by finding the significant differences between the control and the experimental classes, the  $t_{test}$  formula (Sudjana, 2001) was applied in this study.

## RESULT AND DISCUSSION

The quantitative data results came from the pre-test and the post-test results for both EG and CG. The achievement score (AC) was the sum of the Comprehension Score (CS), the Mean Score (MS), and the Technical Terms score (TS).

$$AC = CS + MS + TS$$

Table 1 shows the scores from the pre-tests and the post-tests for both the experimental and the control classes.

**Table 1.** Results of the Statistical Test For Normal Distribution of the Pre-Test Results for Both Experimental and Control Classes.

	$\chi^2_{count}$	$df$	$\alpha$	$\chi^2_{table}$
The Experimental Class	12.75	7	0.05	14.1
The Control Class	7.29	4		9.49

Based on Table 1, at the level of significance  $\alpha = 0.05$  and  $df = (1 - 0.05)$  (*the range of class-I*) = 7, this results in  $\chi^2_{table} = 14.1$  for EC. Then, at the level of significance  $\alpha = 0.05$  and  $df = (1 - 0.05)$  (*the range of class -I*) = 4, this results in  $\chi^2_{table} = 9.49$  for CC. As  $\chi^2_{count}$  for EC is 12.75 and  $\chi^2_{count}$  for CC is 7.29. It can be seen that  $\chi^2_{count}$  for both of the classes was lower than  $\chi^2_{table}$ . Thus, it is concluded that the data from the pre-tests for both classes had a normal distribution.

**Table 2.** Results of the Statistical Analysis for Homogeneity of the Experimental and the Control Classes.

	$F_{count}$	$Df$	$\alpha$	$F_{table}$
The Experimental Class	1.3	(29.29)	0.05	1.84
The Control Class				

Table 2 shows that  $F_{count}$  for both classes is 1.3 and  $F_{table}$  is 1.84. Moreover, comparing these values of  $F_{count}$  and  $F_{table}$ , it can be seen that  $F_{count} < F_{table}$ ,  $1.3 < 1.84$ . Hence, it is concluded that the samples shared the same level of competency or homogeneity.



**Table 3.** Results for the Independent  $t_{\text{test}}$  for Both the Experimental and the Control Classes Pre-Test Results.

	Experimental Class	$s_{\text{gab}}$	$t_{\text{test}}$	$df$	$\alpha$	$t_{\text{table}}$	Control Class
N	30	8.09	1.57	58	0.05	1.68	30
$\bar{x}$	65.1						63.9
$s^2$	74.31						56.96
$S$	8.6						7.5

The independent  $t_{\text{test}}$  results for both EC and CC pre-test results are set-out in Table 3. Thus the mean scores from EC and CC are added in order to do the  $t_{\text{test}}$ . With the level of significance  $\alpha = 0.05$  and  $df = (n_1 + n_2 - 2) = (30 + 30 - 2) = 58$ , the results from the  $t_{\text{table}}$  with the level of significance 0.05 is 1.68 ( $t_{0.95(58)} = 1.68$ ) and the result of the  $t_{\text{test}}$  is 1.57. Thus,  $t_{\text{test}}$  is lower than  $t_{\text{table}}$ . Comparison of the result of  $t_{\text{test}}$  and  $t_{\text{table}}$ , shows that  $t_{\text{test}} < t_{\text{table}}$ , via  $1.57 < 1.68$ . This result indicates that there was no significant difference between the classes in the test data from the pre-test results. This means that EC and CC were similar in terms of their abilities before starting the experimental research treatment.

**Table 4.** The Completion of the Independent  $t_{\text{test}}$  from the Experimental and the Control Class Post-Test Results.

	Experimental Class	$s_{\text{gab}}$	$t_{\text{test}}$	$df$	$\alpha$	$t_{\text{table}}$	Control Class
N	30	5.06	1.92	58	0.05	1.68	30
$\bar{x}$	77.3						75.3
$s^2$	29.59						21.68
$S$	5.43						4.65

EC and CC post-test  $t_{\text{test}}$  results are shown in Table 4. Thus the mean score from EC and CC are compared to calculate the  $t_{\text{test}}$ . With the level of significance for  $\alpha = 0.05$  and  $df = (n_1 + n_2 - 2) = (30 + 30 - 2) = 58$ , the result of  $t_{\text{table}}$  with the level of significance 0.05 is 1.68 ( $t_{0.95(58)} = 1.68$ ) and the result from the  $t_{\text{test}}$  is 1.92. Thus  $t_{\text{test}}$  is higher than  $t_{\text{table}}$ . Comparison of  $t_{\text{test}}$  with  $t_{\text{table}}$ , shows that  $t_{\text{test}} > t_{\text{table}}$ , via  $1.92 > 1.68$ . This result indicates that there was a significant difference in the test data from the two classes in the results from the post-test. In other words, the results from EC and CC were not similar in terms of their abilities. after the experimental class were taught reading comprehension through BUS using authentic texts about computers whilst the control class were taught conventionally.

The diversity test was conducted to find out the differences in achievement of the students from EC and CC before and after the research process. It was found that the  $t_{\text{score}}$  from EC is 13.76 and the  $t_{\text{score}}$  from CC is 12.48. On the other hand, the value of  $t_{\text{table}}$  at a level of significance ( $\alpha$ ) 0, 05 is 1.70 ( $t_{(0.95)(30)} = 1.70$ ). Thus, it is clear that the results from EC are higher than those from CC via  $13.76 > 12.48$ . This indicates that there was a significant difference in the abilities of the students who were taught reading comprehension through BUS using authentic texts about computers and those who were taught conventionally. In conclusion,  $H_a$  was proved in this study.

## **DISCUSSION**

The objective of this study was to prove whether using Bottom-Up Strategy (BUS) with authentic texts about computers could make a significant improvement in reading comprehension abilities by comparison with the conventional way of teaching reading comprehension (i.e. teacher-centered). In this research, improvement in reading comprehension was broken down into three aspects: comprehending, constructing meanings from the context, and understanding and mastering the meaning of technical terms from authentic texts about computers.

Using authentic texts about computers in teaching reading comprehension by BUS to the Department of Information Technology students gave some interesting results. These students major in computer systems which include informatics and applications on coding construction.

The material is developed to teach the students on how to decode the construction of each paragraph. It is well-known that writing is a productive skill, the process of producing paragraphs, from the connecting of words with words until a paragraph is formed. The last factor is the reason for selecting authentic texts about computers as the texts for teaching reading comprehension. It is the computer practicality, or user-friendly feature that has made computers spread and grow so rapidly. This feature makes programmers pay serious attention when they are coding to make programs as friendly as possible. So, factually, the computer command systems have simple language not more than three syllable words as coding commands, workstations, and so on. In fact, the computer user can easily operate the programs. Moreover, most computers initially came from the UK

and the USA, both English speaking countries. Now, however, they mainly come from Taiwan or RC but they still come with English coding. In conclusion, authentic texts about computers are a benefit in the teaching-learning of English as a foreign language to EFL students majoring in IT as it helps them to master the meaning of technical terms in authentic texts about computers thus helping in constructing meaning from context for text comprehension.

BUS is found to be an appropriate strategy to teach the materials. Because after treatments, students now started to think of computers not only as electronic devices, but also as artificial language devices, and that this would help them to gain more understanding of technical terms. In English, the word “coding” has the same meaning with “writing a series of application codes”. As a matter of fact, the coding application process runs in much the same way as writing a paragraph. Therefore, running the learning applications were conducted in the same way as reading a paragraph which technically can be called decoding and thus the reverse process to coding. As BUS is a paragraph decoding process, it is much the same process that students use in decoding computer codes. As the coding is in the computer, the decoding, the reverse process of coding can also exist. It is the application to decode or read the transcription code from the coding process. As discussed above, BUS operates at the word-level, and makes readers focus on the form or the role that each word element plays in a sentence, to paraphrase an expression or a sentence, or to provide multiple meanings, synonyms or antonyms for a single word.

## CONCLUSIONS AND SUGGESTIONS

### Conclusions

Based on the results that if  $t_{\text{test}} < t_{\text{table}}$ ,  $H_0$  would be accepted and  $H_a$  would be rejected. The  $t_{\text{score}}$  for EC is 13.76 and for CC is 12.48. Furthermore, the value of  $t_{\text{table}}$  at level of significance ( $\alpha$ ) 0.05 is 1.70 ( $t_{(0.95)(30)} = 1.70$ ). Thus,  $t_{\text{test}} > t_{\text{table}}$  at  $13.76 > 1.70$  for EC, and also the result from EC is higher than that from CC at  $13.76 > 12.48$ . So,  $H_a$  is proved for this study, in which there was a significant difference between the performance of students who were taught reading comprehension using authentic texts about computers through BUS and those who were taught conventionally.

## **Suggestions**

Students from universities or vocational/polytechnic institutions studying information technology can use computers as learning device, specifically in learning English. Moreover, the students should think of computers not only as electronic devices, but also as artificial language devices, which can help them to understand technical terms, because the computers were originally made with English as the interface language. In this case, Bottom Up Strategy is found to be among the appropriate strategies to use in teaching and learning.

It is suggested that English teachers and other researchers, who want to do research on TEFL, should note the developments in computer assisted-learning for teaching-learning. Given these trends, the development of teaching materials for computer assisted-learning can be helpful to improve the performance of students in reading. Furthermore it could be applied to the other TEFL skills, listening, speaking, and writing.

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